

Abstract:

The present invention relates to a barrel shifter for manipulating bits within computer words. The barrel shifter includes multiple multiplexer stages for rotating single and multiple words. In several embodiments, it provides a half-word alignment in a 2^n -bit barrel shifter, rotates a single 32-bit data word or two 16-bit data words, rotates a 2^n -bit data word or two 2^{n-1} -bit data half-words, a method of operating a 2^n -bit barrel shifter to rotate two 2^{n-1} -bit data words, multiplexer stages for rotating the bits to the left or right based on control signals, such that the stages do not require 2:1 multiplexers between the first and second stages.